

NECK DAM EVALUATION

SECTION 1

INTRODUCTION

When high altitude aircraft personnel are forced to eject from their aircraft over water there is the definite danger that rough water will flood their suits through the neck area when the helmet is removed or the visor is in the off position, unless there is a barrier to prevent it. The introduction of a neck dam around the neck area of the torso assembly alleviates the danger of suit flooding when the helmet is off or when the Phase II type helmet is used and the visor is open. This illustrated report documents the various tests used to formulate a comprehensive evaluation of this new feature in the Pilot's Protective Equipment.

SECTION II

NECK DAM

2.1 Description and Theory of Operation

The neck dam is constructed of black neoprene coated nylon P711 Bladder Cloth (Figure 1). The neck dam is cemented at the neck ring (Figure 2). When the neck dam is not being used it is furled against the neck ring (Figure 3) and held in place with elastic-Velcro tabs (Figure 4). Velcro is also incorporated into the lining around the neck ring opening. Provision for the dual oxygen system hoses has been incorporated as an integral part of the neck dam (Figure 4).

To activate the neck dam the subject pulls out on the drawstrings (Figure 5) which pulls the neck dam free of the elastic-Velcro tabs until it is in the unfurled position (Figure 6). The subject then draws the cord lock assembly (Figure 7) snug against his neck (Figure 8). This procedure assures a comfortable, snug and leak-free seal around the neck.

2.2 Test Location and Conditions

The neck dam water leakage test was performed at an indoor pool in ten (10) feet of water.

The pressure suit worn in the test was the GN-S901E-#1047. Suit and subject were compatible. Subject was in water one (1) hour.

2.3 Test Procedure

Prior to entering pool, subject secured neck dam and inflated flotation garment by actuating CO₂ canisters. The subject jumped into the pool four times from a height of four feet to simulate parachute descents over water. The subject jumped twice with his helmet off and twice with it on and the visor in the UP position (Figures 9 - 10). After each immersion the neck dam area was examined for leakage. There was no indication of leakage after these series of tests.

The subject completely submerged the neck dam for 30 seconds (Figure 11). He surfaced allowing water to run off the neck dam. There was no indication of leakage around the neck area. The subject replaced his helmet with the visor in the UP position and submerged allowing water to flood the helmet. After one (1) minute of flooding the subject surfaced allowing the water to flow out (Figure 12).

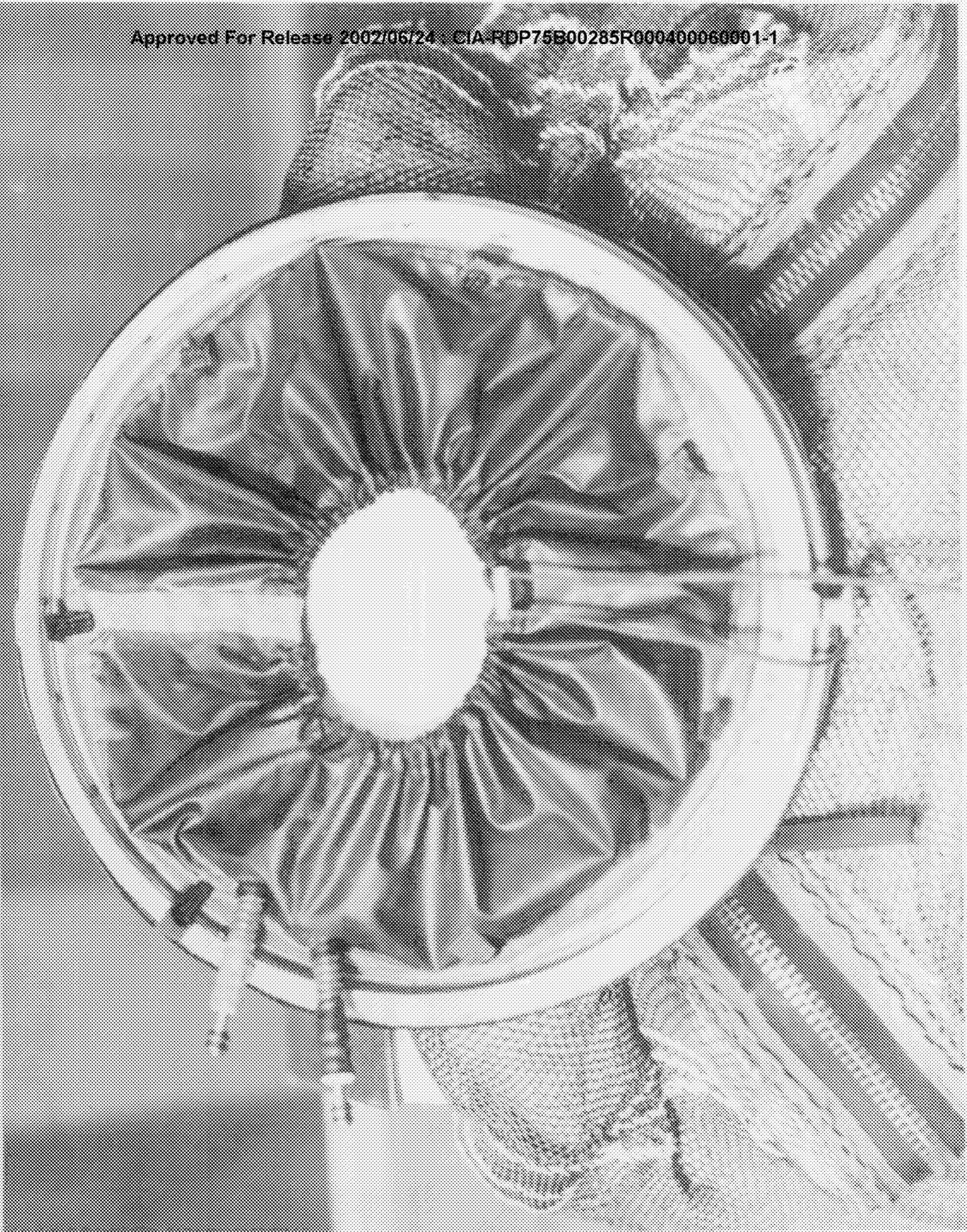
As the subject entered the water, the internal counter pressure within the suit ballooned the neck dam up around the subject's neck thereby assuring a tight seal upon impact (Figure 13).

2.4 Evaluation Summary

After one (1) hour of intensive evaluation the subject's neck directly beneath the neck dam remained absolutely dry. Other main features of this type of neck dam are: it can be secured in a matter of seconds without removing the helmet, and the neck dam is designed for universal fit.

3.0 Recommendations

- 3.1 If the Phase II type helmet is adopted for use, this neck dam will be a prerequisite for the water survival system.
- 3.2 If the helmet is to be removed prior to or after entering the water with the present S901E system, this neck dam should be used to prevent flooding of the suit.



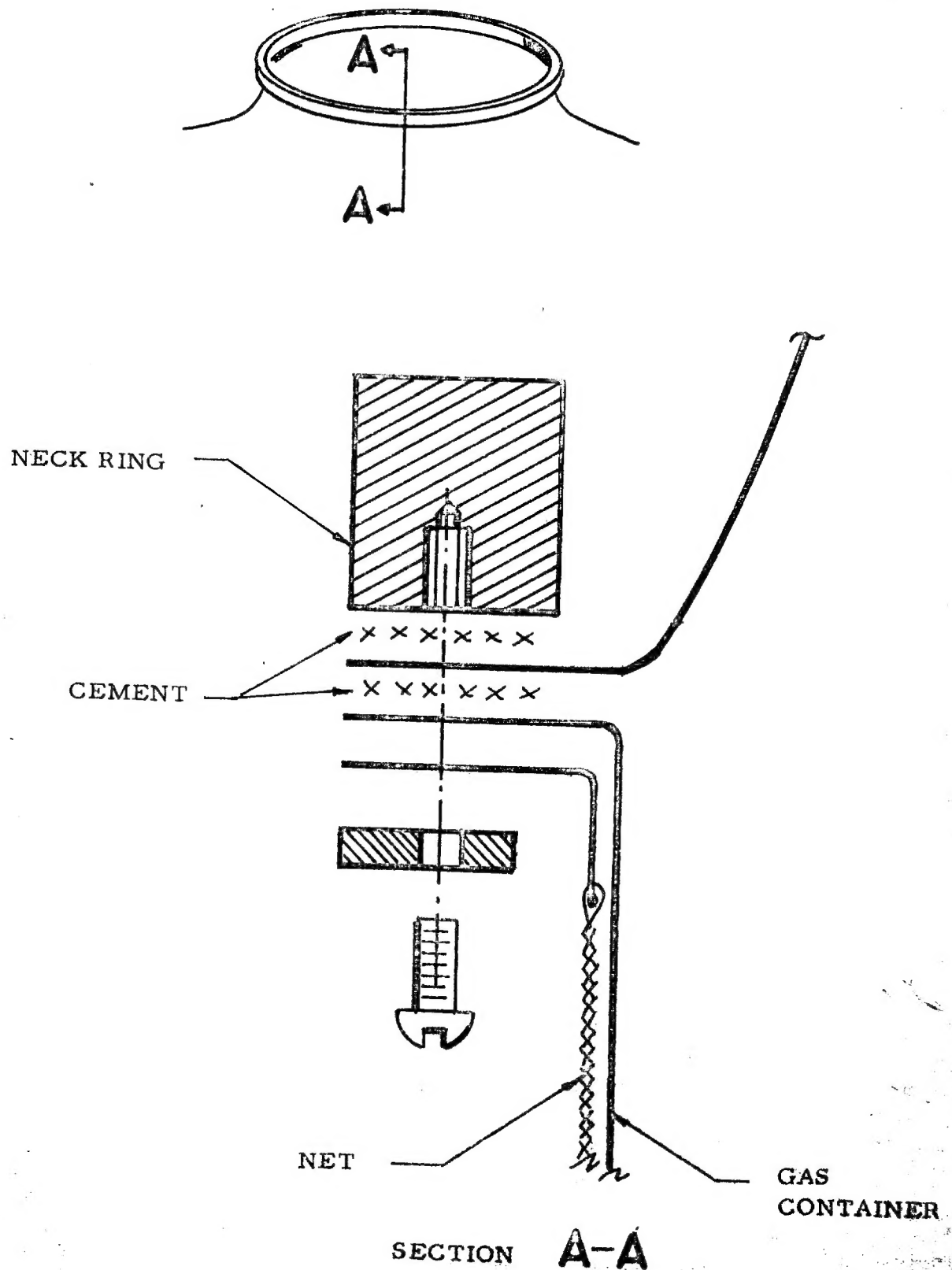


FIGURE 2

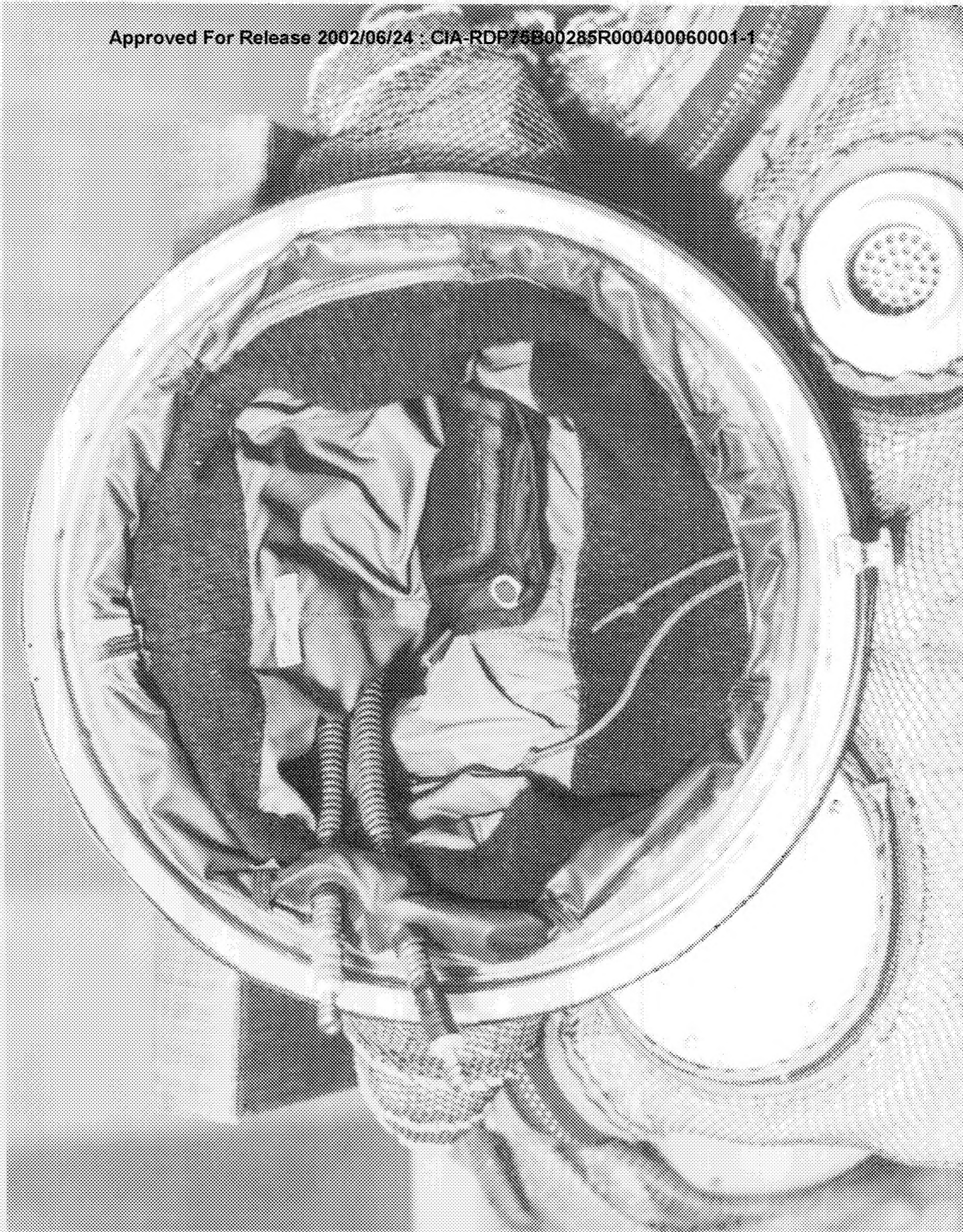
NECK DAM INSTALLATION

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Approved For Release 2002/06/24 : CIA-RDP75B00285R000400060001-1

Approved For Release 2002/06/24 : CIA-RDP75B00285R000400060001-1



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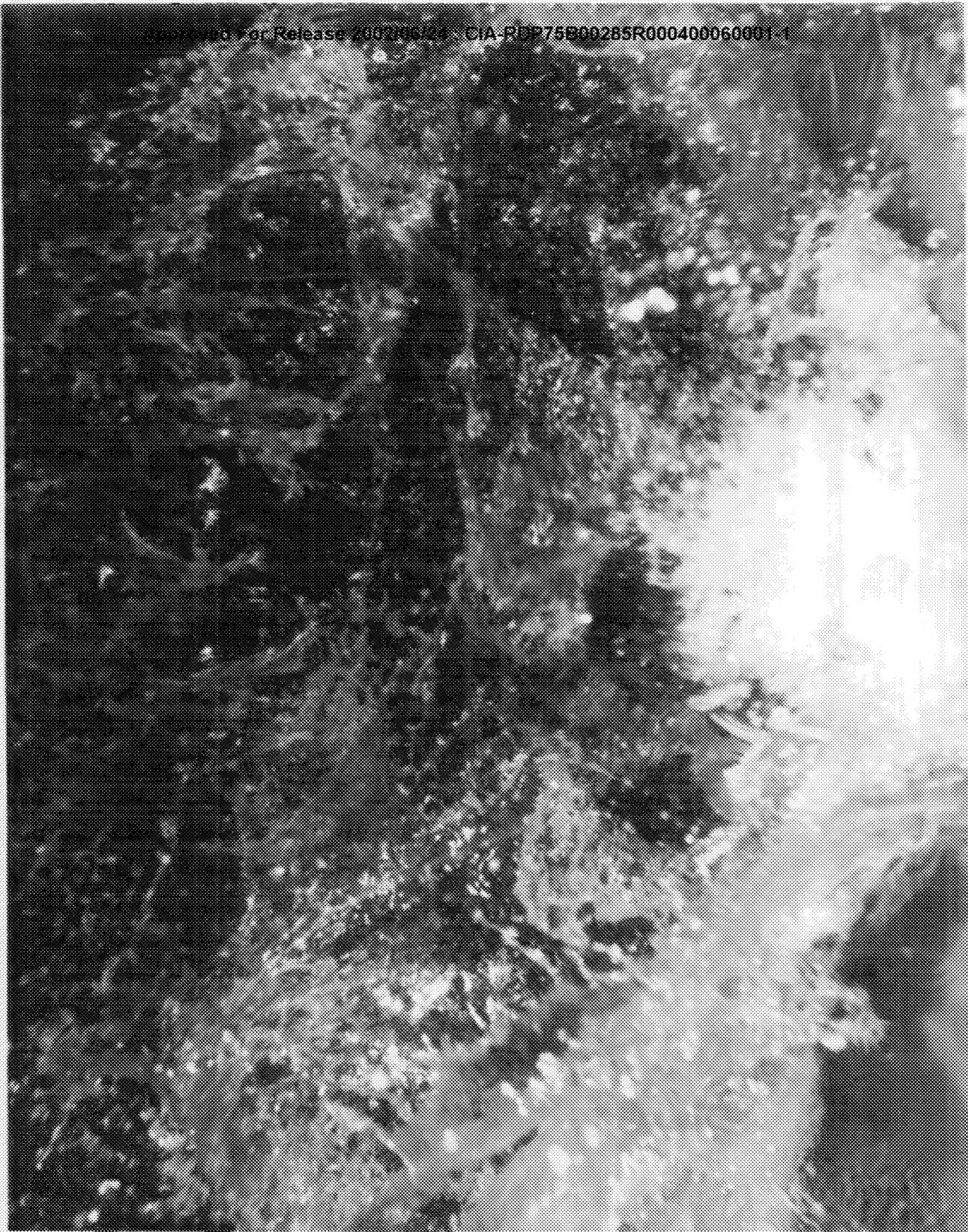


FIGURE 9



FIGURE 10

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